tion in a definite spatial arrangement in a great number of the barbs of the feather, and the repetition of this process in a considerable number of such spots, each spot located upon a separate feather and all of them distributed to form a definite specific and beautiful pattern.

Still more difficult must be the problem when we consider the case of the development of some complex mode of instinctive behaviour—say, the behaviour of the honey-bee which produces the precisely hexagonal waxen cells of the honeycomb. These cells are not only constructed side by side to fill a given space such as the artificial square wooden frames now in general use among bee-keepers; but also each cell is so constructed that it lies nearly, but not quite, horizontally; its open end is slightly tilted up, an arrangement which no doubt contributes greatly to the filling of the cell and to the retention of its liquid contents when filled. And this tilting is to be regarded as *somehow* provided for in the constitution of and the arrangement of the genes in the egg-cell which produces a worker-bee. For, according to the mechanistic theory, every detail of such behaviour is determined by some highly complex systems of nervous connexions in the adult creature's ganglia; and each of these highly complex nervous dispositions is, in turn, determined, in all its multitude of precise details, by some gene or system of genes in the egg-cell. Further, the bees have the power to adapt their constructive activity to the cavity in which the comb is built and

to repair
appropriately injuries suffered by the comb. Whether
this last activity is to be regarded as instinctive in the
strict sense or not, the capacity to effect it must (accord-
ing to orthodox genetic doctrine as confidently laid down